

Application No.: 10/743,389

Docket No.: 21581-00310-US

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Please cancel claims 12, 16, 19 and 20 without prejudice to their reentry at some later date.

1. (Original) A chemical conversion coating agent comprising:
at least one kind selected from the group consisting of zirconium, titanium and hafnium;
fluorine; and
a water-soluble epoxy compound containing an isocyanate group and/or a melamine group,
wherein a content of the at least one kind selected from the group consisting of zirconium, titanium and hafnium in the chemical conversion coating agent is 20 to 10000 ppm in terms of metal, and
a content of the water-soluble epoxy compound containing the isocyanate group and/or the melamine group in the chemical conversion coating agent is 5 to 5000 ppm as a concentration of solid matter.
2. (Previously Presented) A chemical conversion coating agent comprising:
at least one kind selected from the group consisting of zirconium, titanium and hafnium;
fluorine;
water-soluble epoxy compound; and
polyisocyanate compound and/or a melamine resin,
wherein a content of the at least one kind selected from the group consisting of zirconium, titanium and hafnium in the chemical conversion coating agent is 20 to 10000 ppm in terms of metal, and
a total amount of the water-soluble epoxy compound and the polyisocyanate compound and/or the melamine resin in the chemical conversion coating agent is 5 to 5000 ppm as a concentration of solid matter,
wherein said chemical conversion coating agent further contains

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1 to 5000 ppm of at least one kind of a chemical conversion reaction accelerator selected from the group consisting of nitrite ions, nitro group-containing compounds, hydroxylamine sulfate, persulfate ions, sulfite ions, hyposulfite ions, peroxides, iron (III) ions, citric acid iron compounds, bromate ions, perchlorinate ions, chlorate ions, chlorite ions, ascorbic acid, citric acid, tartaric acid, malonic acid, succinic acid and salts thereof.

3. (Previously Presented) The chemical conversion coating agent according to claim 1, wherein the water-soluble epoxy compound has an amino group.
- 4-6. (Canceled)
7. (Previously Presented) The chemical conversion coating agent according to claim 1, wherein a pH thereof is 1.5 to 6.5.
8. (Previously Presented) A surface-treated metal having a chemical conversion coat formed by the chemical conversion coating agent according to claim 1.
9. (Original) The surface-treated metal according to Claim 8, wherein the chemical conversion coat has a coat amount of 0.1 to 500 mg/m² in sum of a total amount of metals contained in the chemical conversion coating agent and carbon contained in the water-soluble epoxy compound.
10. (Previously Presented) The surface-treated metal according to claim 8, wherein a substance to be treated comprises an iron material, a zinc material and/or an aluminum material.
11. (Previously Presented) The chemical conversion coating agent according to claim 2, wherein the water-soluble epoxy compound has an amino group.

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12. (Canceled)

13. (Previously Presented) The chemical conversion coating agent according to 3, containing 1 to 5000 ppm of at least one kind of a chemical conversion reaction accelerator selected from the group consisting of nitrite ions, nitro group-containing compounds, hydroxylamine sulfate, persulfate ions, sulfite ions, hyposulfite ions, peroxides, iron (III) ions, citric acid iron compounds, bromate ions, perchlorinate ions, chlorate ions, chlorite ions as well as ascorbic acid, citric acid, tartaric acid, malonic acid, succinic acid and salts thereof.

14. (Previously Presented) The chemical conversion coating agent according to claim 2, containing

at least one kind selected from the group consisting of: at least one kind of metal ions (A) selected from the group consisting of zinc ions, magnesium ions, calcium ions, aluminum ions, manganese ions and iron ions; copper ions (B); and a silicon-containing compound (C).

15. (Previously Presented) The chemical conversion coating agent according to claim 3, containing

at least one kind selected from the group consisting of: at least one kind of metal ions (A) selected from the group consisting of zinc ions, magnesium ions, calcium ions, aluminum ions, manganese ions and iron ions; copper ions (B); and a silicon-containing compound (C).

16. (Canceled)

17. (Currently Amended) The chemical conversion coating agent according to claim 14 2, wherein the silicon-containing compound (C) is at least one kind selected from the group consisting of silica, water-soluble silicate compounds, esters of silicic acid, alkyl silicates and silane coupling agents.

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18. (Currently Amended) The chemical conversion coating agent according to claim 15 3,
wherein the silicon-containing compound (C) is at least one kind selected from the group
consisting of silica, water-soluble silicate compounds, esters of silicic acid, alkyl silicates and
silane coupling agents.

19. (Canceled)

20. (Canceled)

21. (Previously Presented) A chemical conversion coating agent, containing no chromium,
comprising:

at least one member selected from the group consisting of zirconium, titanium and
hafnium;

fluorine;

a water-soluble epoxy compound; and a polyisocyanate compound and/or a melamine
resin,

wherein a content of the at least one member selected from the group consisting of
zirconium, titanium and hafnium in the chemical conversion coating agent is 20 to 10000 ppm in
terms of metal, and

a total amount of the water-soluble epoxy compound and the polyisocyanate compound
and/or the melamine resin in the chemical conversion coating agent is 5 to 5000 ppm as a
concentration of solid matter,

wherein said chemical conversion coating agent further contains

at least one member selected from the group consisting of: at least one kind of metal ions
(A) selected from the group consisting of zinc ions, magnesium ions, calcium ions, aluminum
ions, manganese ions and iron ions; copper ions (B); and a silicon-containing compound (C), and

said silicon-containing compound (C) being at least one member selected from the group
consisting of silica, water-soluble silicate compounds, esters of silicic acid, alkyl silicates and
silane coupling agents.